

### REMARKS

Further and favorable reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

Initially, Applicants express their appreciation for the courtesy of a personal interview granted to their attorney by Examiner Menon and Primary Examiner Drodge on April 1, 2003, the results of which are summarized in the Interview Summary form.

The specification has been amended to make minor changes, which are essentially self-explanatory.

Claim 1 has been amended to overcome the rejection of this claim under the second paragraph of 35 U.S.C. §112. The Examiners appeared to agree, during the interview, that this amendment to claim 1 will be effective to overcome this rejection.

Claim 6 has also been amended as discussed during the interview, to make an editorial change.

Attached hereto is a marked-up version of the changes made to the specification and claims 1 and 6 by the current amendment. The attached pages are captioned "Version with markings to show changes made."

New claims 12-19 have been added to the application.

New claim 12, which will be further discussed below in the context of the interview, corresponds to claim 1, except the word "paper" from line 4 has been moved to the preamble, and the "heating and pressing" in line 4 has been replaced by --calendared-- in line 2 of claim 12. The word "calendared" is supported by page 13, lines 7, 15 and 25 of the specification.

New claims 13-19 correspond to original claims 2-8, respectively, except that they are directly or indirectly dependent on new claim 12.

The patentability of the present invention over the disclosures of the references relied upon by the Examiner in rejecting the claims will be apparent upon consideration upon the following remarks.

### Present Invention

The present invention is directed to a semipermeable membrane support technology to solve the problem discussed in the specification that

[0003]...when the (polymer) casting solution is applied to one face of the support, the support bends in the width direction, which becomes a hindrance to the treatment in the coagulation and rinsing bath following the roll feed, resulting in an uneven semipermeable membrane produced.

To solve this problem,

[0007]...the semipermeable membrane support has a ratio of a tensile strength in a paper feeding direction to that in a width direction of 2:1 to 1:1, to prevent the bend in the width direction during the semipermeable membrane formation.

Attention is also directed to Sketch 1 and Reference Figure 1 attached hereto, which were briefly discussed with the Examiners during the interview. Sketch 1 shows how paper bending or curling occurs, in which:

- (1) A support (paper) itself is flat, not curled.
- (2) By applying semipermeable membrane onto the support, (3) it tends to be naturally curled, because a membrane which is applied to the surface of the support has a different shrinkage ratio in a length and width direction. For example, if the tensile strength in the length direction is high, then the shrinkage effect is released and thus curling is prevented in this direction, and if the tensile strength in the width direction is low, then shrinkage causes curling in the width direction.

Curled paper becomes difficult to be further processed. For example, this membrane applied paper has to be wound in the other, orthogonal direction to the curled direction as shown in (5) for further processing. Because the curling direction and the winding direction are orthogonal in production, it would be hard to wind the paper if the curling force is strong, e.g., the edge of the paper is more likely to be curled and thus uniform winding might be prevented. Extra load to control curling is required. In addition, the curling force may damage the membrane because the membrane is coated on the upper side of the paper as shown in Sketch 1, and this paper is loaded or pressed on

the coated side. The more curling force, the more pressing load required, and this causes uneven pressing, resulting in partial damage to the membrane.

To prevent these problems, the present invention specifies a ratio of tensile strength in a paper feeding direction to that in a width direction of 2:1 to 1:1 to reduce curling.

In an Example, Applicants prepared samples comparing Example 1 and Comparative example 2 as described in the specification. See Reference Figure 1 attached hereto, which corresponds to Table 1 in the specification.

Table 1

	Example 1	Comparative Example 2
Weight (g/m <sup>2</sup> )	70	71
Tensile strength ratio Longitudinal/Transverse	1.3	4.4

Table 1 clearly shows that the diameter of curvature of Example 1 is 27 mm $\phi$ , 59% larger than Comparative example 2, 17 mm $\phi$ , which means that the curling force is substantially released by employing the present invention so that controlling of curling becomes easier.

Reference Figure 1 also shows how much weight is needed to control, i.e., overcome the curling force. It shows that Example 1 of the present invention has less curling force than Comparative Example 2, i.e. Example 1 is 4.88 g, only 41% load compared with 11.81 g needed to control curling in Comparative example 2.

This advantageous effect makes subsequent processing easier as explained above and in Sketch 1.

#### Cited References

The rejection of claims 1-7 under 35 U.S.C. §102(b) as being anticipated by Goettmann is respectfully traversed.

Referring to the Examiner's discussion of this reference in the last two paragraphs on page 2 of the Office Action, the Examiner states that Goettmann teaches a ratio of tensile strength between the paper feed direction and width direction as 1.5:1, referring to Table 1 in the reference.

However, as noted during the interview, this ratio is for the uncalendared composite material in Table 1, showing an MD:CD ratio of 1.8:1.2, which is equal to a ratio of 1.5:1. The corresponding ratio for the calendared material in Table 1 of the reference is 35:10, i.e. 3.5:1, which is above the upper limit of 2:1 for the ratio recited in the presently claimed invention. The calendared material in Goettmann corresponds to Applicants' Comparative example 2 as discussed above, which suffers from a higher curling force than in the present invention as also discussed above.

During the interview, the Examiner suggested that perhaps claim 1 of the present application is a product by process claim in view of the language "manufactured by paper making, heating and pressing", and that the support of claim 1 could therefore be compared with the uncalendared material of Goettmann, reference having been made in this regard to the decision of *In re Thorpe*, 227 USPQ 964 which is cited in MPEP §2113. However, Applicants respectfully submit that the product as claimed in claim 1 is clearly distinct from both the uncalendared material and calendared material in Goettmann. The claimed product is different from the uncalendared material of Goettmann because the claimed product is one which has been subjected to heating and pressing, corresponding to calendaring, after paper making, and even if this language is set forth in product by process format, it is still a claim limitation which must be considered in judging the patentability of the invention over the prior art.

The claimed product is also different from the calendared material of Goettmann because of the different tensile strength ratio as discussed above, i.e. 3.5:1 in Goettmann verses 2:1 to 1:1 in the present invention.

Referring to MPEP §2113, it states that if the product in the product by process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior art product was made by a different process, citing the *Thorpe* decision. However, it is apparent that the product of claim 1 of the present application is not the same (or obvious) from the product of Goettmann. For the sake of discussion, Table 1 of Goettmann discloses two separate products, one

being uncalendared and the other being calendared. The uncalendared product has a MD:CD ratio of 1.5:1. The calendared product has a MD:CD ratio of 3.5:1. There is no calendared product disclosed in the reference having an MD:CD ratio of 1.5:1, or any other ratio within the presently claimed range. Both the uncalendared and calendared products of the reference are distinct from the product as claimed in claim 1, considering the fact that the product of claim 1 must be one in which the non-woven fabric is manufactured by paper making, heating and pressing. This limitation, even if it is in product by process format, is still a limitation which must be considered when comparing the claimed product with either the uncalendared or the calendared material of Goettmann. As noted in MPEP §2113, once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to Applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. Applicants respectfully submit that the Examiner has not provided any rationale tending to show that the presently claimed product is the same as or similar to the uncalendared or calendared product of Goettmann, since the uncalendared product is not one which has been heated and pressed as required in the present invention, and the calendared product of the reference does not have the tensile strength ratio required in the present invention.

Furthermore, attention is directed to new claim 12 (and new claims 13-19 dependent thereon), which requires a calendared non-woven fabric, and thus cannot be compared with the uncalendared material of Goettmann. It is Applicants' position that the product of claim 12, as well as the product of claim 1, and the claims dependent on each of these claims, are patentable over Goettmann.

Also in connection with this rejection, the Examiner specifically refers to instant claim 5, which according to the Examiner is anticipated by Goettmann because the product of the reference would inherently have a porosity between 5 and 15 microns. However, Goettmann does not disclose pore size, and one cannot say that a similarity in air permeability necessarily results in the same pore size, because air permeability depends on many factors, such as pore size and number of pores, etc.

For these reasons, Applicants take the position that the presently claimed invention is not anticipated (or suggested) by Goettmann.

The rejection of claim 8 under 35 U.S.C. §102(b) as being anticipated by Shinjou et al. is respectfully traversed.

Although the Office Action indicates that this reference teaches a semipermeable membrane support made by heating and pressing after paper making with a tensile strength ratio of 1:1, referring to Table 1 of the reference, as noted during the interview Table 1 of the reference does not disclose such a tensile strength ratio. Rather, Table 1 refers to various tensile strengths in terms of the number of kg/15 mm. For instance, Example 1 in Table 1 of Shinjou et al. shows a tensile strength of 15 kg/15 mm, but there is no indication of a tensile strength ratio in terms of the tensile strength in a paper feeding direction to that in a width direction as in the present invention. Table 1 of the reference also shows % elongation, but elongation is not the same as tensile strength ratio. Applicants take the position that this reference fails to disclose or suggest any tensile strength ratio within the scope of the presently claimed invention.

Accordingly, the subject matter of claim 8 is considered to be patentable over Shinjou et al.

The rejection of claim 5 under 35 U.S.C. §103(a) as being unpatentable over Goettmann is respectfully traversed.

The comments set forth above concerning the Goettmann reference are considered to be equally applicable to this rejection, both with regard to claim 1 (on which claim 5 is dependent) and claim 5 itself.

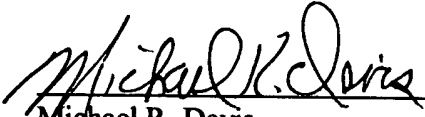
In summary, Applicants take the position that neither of the applied references discusses the curling problem which is solved by the present invention, nor do the references disclose or suggest a semipermeable membrane support having a ratio of tensile strength in a paper feeding direction to that in a width direction of 2:1 to 1:1 as required in the present invention.

For these reasons, Applicants respectfully submit that the presently claimed invention is clearly patentable over the applied references.

Therefore, in view of the foregoing amendments and remarks, it is submitted that each of the grounds of rejection set forth by the Examiner has been overcome, and that the application is in condition for allowance.

Respectfully submitted,

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